



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,347	08/16/2001	Bangalore Aswatha Nagaraj	13DV14035	2644

31316 7590 02/21/2003

GREGORY GARMONG  
P.O. BOX 12460  
ZEPHYR COVE, NV 89448

EXAMINER

MCNEIL, JENNIFER C

ART UNIT	PAPER NUMBER
----------	--------------

1775

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/931,347	<b>Applicant(s)</b> NAGARAJ ET AL.	
	<b>Examiner</b> Jennifer McNeil	<b>Art Unit</b> 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 November 2002.
- 2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2, 3, and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Darolia et al (US 6,190,471). Darolia teaches a superalloy article with a coating thereon. The coating includes a protective layer (34) of a diffusion aluminide, such as a platinum aluminide. The protective layer may also include an element such as hafnium. The hafnium is formed in the protective layer by diffusion from the substrate (col. 6, lines 17-67). The protective layer has about 1 wt% Hf after formation of the article (col. 7, lines 13-27). A ceramic layer may be deposited on the aluminide, and the article may be a turbine blade (col. 3, lines 25-30; col. 4, lines 13-17).

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Darolia et al (US 6,344,282). Darolia et al teach a diffusion aluminide coating having a graded structure. The substrate is a nickel base superalloy with a substrate surface, and the coating has an inner region of a diffusion aluminide including a reactive element such as Hf. A thermal barrier coating (40) may be applied over the aluminide coating. Specifically, Darolia gives an example of Hf added to

the aluminide wherein the Hf is disposed in a gradient. At depths of 0-5 microns, the Hf is present at 0.11 wt%; at depths of 5-15 microns, the Hf is present at 0.51 wt%; and at depths of 15-30 microns the Hf is present at 6.9 wt% and Al is present at 20.7 wt %. Also, Darolia gives an example where the Pt is present at 27.5 wt% at 5-15 microns or 29 wt% at 15-30 microns (see examples 4 and 5). Essentially, with increasing distance inward from the outer surface towards the substrate, the reactive element concentration (hafnium) will increase to a peak level and then decrease until the element approaches zero near the surface of the substrate (col. 6, line 65- col. 7, line 4). Darolia also clearly teaches that a diffusion zone will be present when a nickel base superalloy is used (col. 4, lines 55-60).

### *Response to Arguments*

Applicant's arguments have overcome the 112, second paragraph rejection of the previous office action.

Applicant's arguments filed November 29, 2002 have been fully considered but they are not persuasive. Applicant argues that neither reference teaches an outer layer that is substantially a single phase. Applicant defines "substantially a single phase" on page 7 of the instant specification. It is considered to mean that the amount of second phase must be less than about 10 percent by volume or less of the outer layer.

Darolia '471 teaches a protective layer on a superalloy article. The protective layer comprises a platinum aluminide modified with hafnium that is diffused from the substrate. The amount of hafnium that is present in the coating is equal to or less than the amount of hafnium present in the substrate (col. 6, lines 53-60). This amount is 0.2-2 wt%. Darolia '471 does not specifically state that the aluminide coating is present in a single phase. However, the instant specification teaches that the hafnium content in the protective coating near the outer surface (40) is not greater than 0.5 wt%, which overlaps with the total amount of hafnium that may be present in the coating of Darolia '471. Because Darolia does not recognize multiple phases due to the addition of hafnia at such low amounts, it is the position of the examiner that the coating is a

single phase. Applicant has offered no argument or evidence that the method of deposition of Darolia '471 does not result in a single-phase coating. It is also noted that instant claim 1 does not positively recite hafnium in the outer layer. The language used allows for no hafnium to be present.

Darolia '282 teaches graded reactive element containing aluminide coatings. The coating comprises platinum, aluminum, and a graded concentration of hafnium. Darolia teaches a diffusion layer (34) that comprises the Pt, Al, and Hf, and an outer layer (36) of Pt,Al that is substantially free of reactive elements such as Hf. Darolia '282 clearly teaches that the diffusion layer (34) has a gradient that is commensurate in depth and concentration with the instant claims. Darolia '282 does not specifically state that the outer area of the graded layer is present in a single phase. However, Darolia '282 does state that a *gradient of phases* is present as is a gradient of concentration (col. 6, lines 45-51). It is fully expected that since the concentrations are present in a gradient that overlaps with the instant claims, the outer area of the diffusion layer would have a lower concentration of phases present (as it is expected that the phases correspond to the concentration), such that it overlaps with applicant's definition of "single phase". Applicant has offered no argument or evidence that the method of deposition of Darolia '282 does not result in a single-phase coating. It is also noted that instant claim 1 does not positively recite hafnium in the outer layer. The language used allows for no hafnium to be present.

### *Conclusion*

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer McNeil whose telephone number is 703-305-0553. The examiner can normally be reached on Monday through Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 703-308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



JCM  
February 12, 2003

Jennifer McNeil  
Examiner  
Art Unit 1775

  
DEBORAH JONES

SUPERVISORY PATENT EXAMINER